



Open Defective Trapezium Fracture Treated with Local Bone Graft: A Case Report

Lokal Kemik Grefti ile Açık Defektif Trapezium Kırığı: Bir Olgu Sunumu

Open Defective Trapezium Fracture

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Özet

Trapezium kırıkları nadir kırıklardır ve tüm karpal kemik kırıklarının %3-5'ini oluştururlar. Bunların yaklaşık %20'si vertikal sagittal split kırıklardır ve izole olarak çok nadir görülürler. Literatürde bildirilen trapezium kırıkları çok azdır. Normal başparmak fonksiyonunun kazanılabilmesi için açık trapezium kırıklarında yaralanmış yapıların tam restorasyonu sağlanmalıdır. Aksi takdirde hareket kısıtlılığı, ağrı ve kuvvetsizliğe bağlı fonksiyon kayıpları görülebilir. Bu vaka takdiminde distal radiustan elde edilen lokal kemik grefti ile defektif trapezium kırığının tedavisi sonucu normal başparmak fonksiyonu elde edilmesi sunulmuştur.

Anahtar Kelimeler

Trapezium kemiği; Kemik transplantasyonu; Radius

Abstract

Generally fractures of trapezium are uncommon and account for 3-5% of all carpal fractures. About 20% of these are vertical sagittal split fractures and rarely occur isolated. The number of reported cases of open trapezium fractures is few. Open trapezium injuries of thumb are demanding injuries that need accurate restoration of damaged structures to gain normal thumb function. Otherwise it results in impairment of function due to limitation of motion, pain and weakness of the thumb. In this case report treatment of trapezium fracture with corticocancellous bone grafting from distal radius presented.

Keywords

Trapezium Bone; Bone Transplantation; Radius

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Introduction

Generally fractures of trapezium are not common and account for 3-5% of all carpal fractures [1]. About 20% of these are vertical sagittal split fractures and rarely occur isolated. Trapezium fractures are often associated with other carpometacarpal injuries such as Bennet fracture, Rolando fracture, fractures of scaphoid, distal radius and dislocations. The number of reported cases of open trapezium fractures is few [2].

The carpometacarpal joint is necessary for functional motion and strength of the thumb. Any damage to the articular surface of the trapezium or the base of the first metacarpal bone leads to restriction of all ranges of movements from extension through abduction to flexion. It should be restored to its normal anatomy to prevent loss of motion, stiffness and pain [3]. Most carpal defective fractures require autologous bone grafting [4]. For defective scaphoid fractures using distal radial metaphysis as graft donor site is found effective [4,5]. In this study we present open trapezium fracture treated with local bone graft from distal radial metaphysis.

Case Report

A 56 years old man admitted to our emergency department with the complaint of cut in his dominant right wrist. He was helping a companion while cutting wood with a power saw. After initial prophylactic treatment, open defective trapezium fracture was detected via radiological evaluation (Figure 1). For further examination and surgical treatment patient referred to hand surgery operating room.

Under axillary anesthesia and after tourniquet the wound was cleaned, abductor pollicis longus tendon, extensor pollicis brevis tendon and cutaneous branch of radial nerve was found divided. Wound was extended to proximal over radial styloid to achieve corticocancellous bone graft from distal radius metaphysis. Radial artery was identified and retracted. After lateral aspect of distal radius uncovered cancellous bone graft with 2 flat surfaces obtained. The graft was shaped to adjust the defect of trapezium. Graft was placed and secured with 2 K-wires (Figure 2). Tendons and nerve was sutured end to end. After closure cast was applied to hand with slight radial deviation and extension. Physiotherapy started on the second week as passive motion of the thumb and active motion was started on 6th week when the cast and K-wires were removed. The patient went back to work at the fourth month of injury.

Discussion

Trapezium fractures are rare and comprises 3-5% of all carpal bone fractures [6]. Frequently they are associated with other carpometacarpal injuries and isolated trapezium fracture is rare [6,7]. Open trapezium injuries are demanding injuries and need accurate restoration of trapezium to gain normal thumb function. Otherwise contracture of the first web space and stiffness of carpometacarpal joint results in impairment of function due to limitation of motion, pain and weakness of the thumb. In conservatively treated patients by closed reduction and cast immobilization more than 60% had persistent pain, swelling or limitation of movements of wrist [7].

Various methods of treatment have been described to regain the articular congruity after trapezium fractures [3,6,7]. Using



Figure 1. AP x-ray of the wrist at emergency room showing trapezium fracture and defect between fragments



Figure 2. Postoperative AP x-ray showing fixation of fracture with local bone graft and donor site

corticocancellous bone graft from distal radius metaphysis for defective carpal fractures and scaphoid nonunions became a popular treatment option [4]. Using distal radius as donor site causes less donor site complications, adds advantage of one single incision and regional anesthesia according to iliac crest [4,8]. In this case anterolateral border of distal radius metaphysis was used to secure the congruity of first carpometacarpal joint. In our case no major complication such as distal radial fracture occurred.

Radial artery injuries associated with trapezium fractures are known. Beside this there is less information about injuries of other structures such as tendons and nerves. These structures can be wounded by cutting surfaces of fragments or as in this case by cutting power saw. Management of these injuries depends on their injury pattern and usually reconstruction of these structures is needed. In this case divided abductor pollicis longus tendon, extensor pollicis brevis tendon and cutaneous branch of radial nerve could be sutured end to end [3,7].

Although early active exercises should be encouraged as soon as possible, passive motion of the thumb was allowed at the end

of the second week because of associated tendon and nerve injuries [3]. Physiotherapy of thumb function could contain electrical stimulation. In this case only cutaneous sensory branch of radial nerve was divided and electrical stimulation did not used. Physiotherapy consist of range of motion exercises. Active thumb motion allowed on the 6th week when the cast and K wires removed.

In conclusion, there are many methods of treatment in trapezium fractures. To prevent limitation of thumb motion first carpometacarpal joint congruity should be secured. In this case treatment of defective trapezium fracture was achieved by local bone graft to preserve first carpometacarpal motion successfully.

Competing interests

The authors declare that they have no competing interests.

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